

Next Steps for the Waste Minimization Prioritization Tool

Slide Presentation

Next Steps for the Waste Minimization Prioritization Tool?

**Presented to the
Tools for Sustainability Workshop
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Purpose of Presentation

- ◆ **Provide background on the WMPT and describe underlying philosophy and approach**
- ◆ **Explore opportunities to partner with other organizations to help meet needs for screening information and provide appropriate stewardship of the information**

Background on the WMPT

- ◆ **Chemical risk screening tool intended to identify priority chemicals for voluntary source reduction and recycling initiatives by industry and others**
- ◆ **Developed by EPA's Office of Solid Waste and Office of Pollution Prevention and Toxics with substantial assistance from Office of Research and Development**
- ◆ **Derived from OPPT's Use Cluster Scoring System**
- ◆ **Windows-based beta version of WMPT released for public comment in June 1997**
- ◆ **Revised spreadsheet version released in November 1998**

Current/Anticipated Uses of the Revised WMPT

- ◆ **OSW – foundation for Draft RCRA PBT List -- when final, this list will guide national waste minimization program**
- ◆ **PBT Initiative – proposed for use in identifying additional chemicals for cross-Agency action**
- ◆ **ORD – data for Pollution Prevention Progress system**
- ◆ **OPPT – data for Use Cluster Scoring System**

WMPT Philosophy/Approach

Screen thousands of chemicals based on chronic human health and environmental concerns

Revised WMPT currently includes data and rankings for about 4,200 chemicals

Information for the 1,300 highest-scoring chemicals included in public docket for Draft RCRA PBT List

Focus on a few key indicators of potential hazard/risk: persistence, bioaccumulation potential, and chronic human and ecological toxicity

WMPT Philosophy/Approach

Use “best” data readily available from a variety of EPA and other sources

Follow established “data preference hierarchies”

Use measured data when available; use predicted data when not

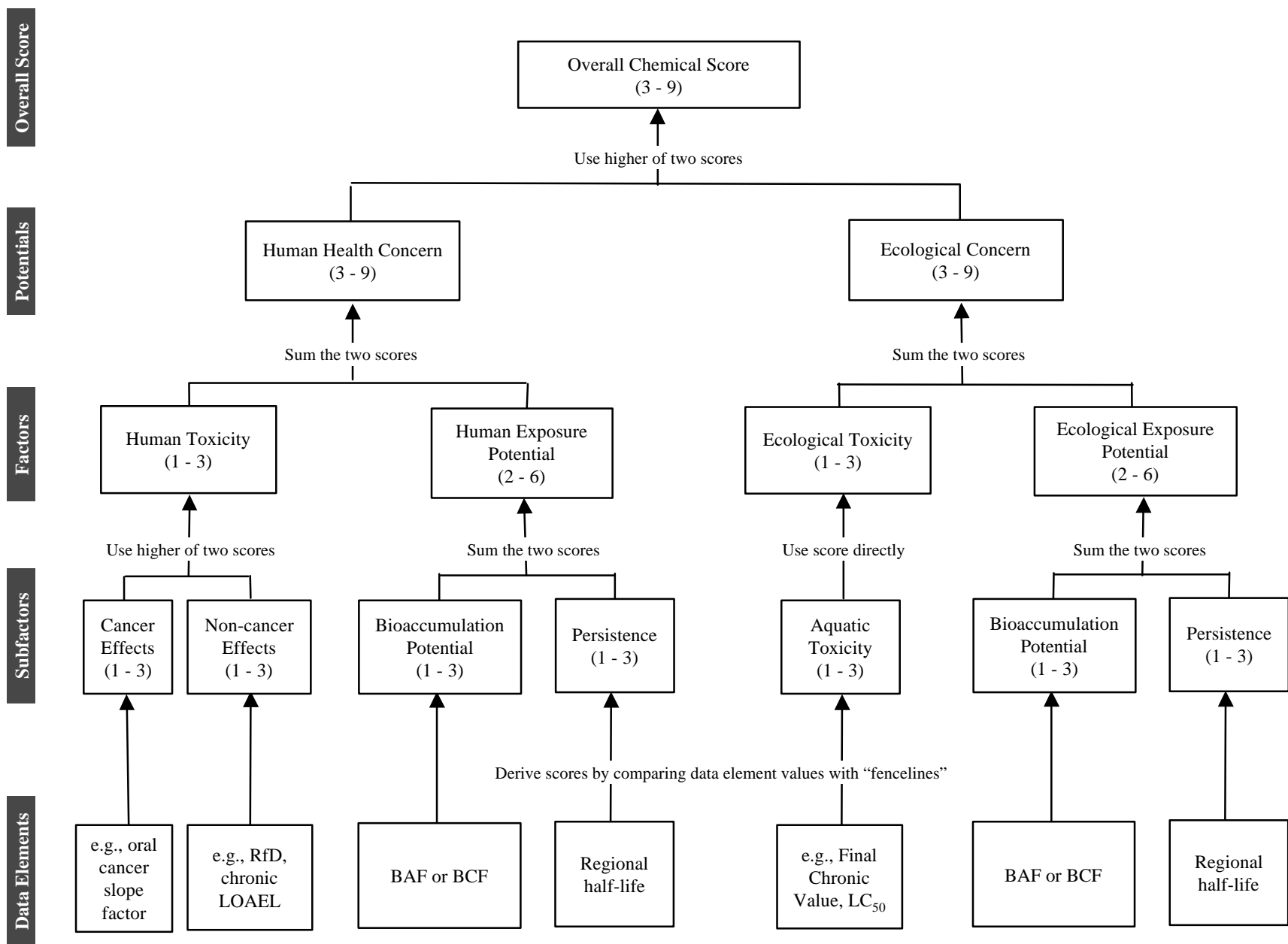
Score chemicals low/medium/high for P, B, and T by comparing data values with “fencelines” (thresholds)

Use fencelines based on expert judgment when available; use 1:2:1 distributions when not

WMPT Philosophy/Approach

Promote consistency between OSW, OPPT, and other Offices' screening efforts

Generally adopt a conservative screening approach based on most sensitive endpoints



Persistence Estimation

Use Level 3 multimedia partitioning (fugacity) model

Import half life values for persistence in air, water, soils, and sediments (and other data on physical/chemical properties)

Assume initial release is 1/3 to air, 1/3 to water, and 1/3 to soils

Model provides estimated “regional” (overall) persistence value

Mass fractions (ultimate % distributions) to air, water, soils, and sediments also provided

Persistence Data Preference Hierarchy (Half Lives)

Data Source	Data Element	Preference Level
Howard et al, Handbook of Environmental Degradation Rates	X Measured Half-life Data (air, water, soil, sediment (anaerobic))	Highest
MacKay D., Shiu W.Y., and Ma K.C., Illustrated Handbook of Physical- Chemical Properties and Environmental Fate for Organic Chemicals	X Measured Half-life Data (air, water, soil, sediment)	High
The Agriculture Research Service (ARS) Pesticide Properties Data Base (PPD)	X Measured Half-life Data (soil (aerobic), sediment (anaerobic))	Medium
Atmospheric Oxidation Program (AOPWIN)	X Estimated Half-life Data (air)	Low
Ultimate Survey Model (USM)	X Estimate of Biodegradation Time (water; surrogate for soil and sediment)	Low
HYDROWIN	X Estimated Hydrolysis Rate (water; surrogate for soil and sediment)	Low

Bioaccumulation Data Preference Hierarchy

Data Source		Data Element	Preference Level
DRAFT HWIR	<	Measured BAF	Highest
Mercury Report to Congress	X	Measured BAF	Highest
DRAFT HWIR	<	Measured BCF	High
Ambient Water Quality Criteria documents	X	Measured BCF	High
SRC ISIS BCF File	<	Measured BCF	High
DRAFT HWIR	<	Predicted BAF	Medium
DRAFT HWIR	<	Predicted BCF	Low
BCFWIN (Part of EPI Suite)	<	Predicted BCF	Low

Human Non-Cancer Data Preference Hierarchy

Data Source	Data Element	Preference Level
IRIS	< Reference Dose (RfD)	Highest
	< Reference Concentration (RfC)	
ATSDR	< Oral Minimal Risk Level (MRL)	High
	< Inhalation MRL	
HEAST	< RfD	High
	< RfC	
OERR RQ Database	< Chronic Toxicity Reportable Quantity (RQ)	Medium
Toxic Substances Control Act (TSCA) Section 4 Data	< Subchronic NOAEL	Medium
	< Subchronic LOAEL	
	< Developmental NOAEL	
	< Developmental LOAEL	
DRAFT Cal/EPA Noncancer Chronic RELs	< Inhalation Reference Exposure Levels (RELs, similar to RfCs)	Medium
TSCA Section 8(e)	< Triage screening results	Low
CESARS	< Oral Mammalian Sublethality Score (based solely on NOAEL)	Low
OPPT database	< Human Health Structure Activity Team (SAT) Rankings	Lowest

Human Cancer Data Preference Hierarchy

Data Source	Data Element	Preference Level
WEIGHT-OF-EVIDENCE		
IRIS	< Weight-of- Evidence	Medium
HEAST	< Weight-of- Evidence	Medium
IARC	< Weight-of- Evidence	Medium
National Toxicology Program (NTP)	< Weight-of- Evidence	Medium
CANCER SLOPE FACTOR (i.e., CANCER POTENCY FACTOR)		
IRIS	< Oral Slope Factor	Highest
	< Inhalation Unit Risk	
HEAST	< Oral Slope Factor	High
	< Inhalation Slope Factor	
EPA Cancer Data Documents	< Oral Slope Factor	High
CERCLA Section 102 background document	< RQ Potency Factor	Medium
DRAFT Cal/EPA Standards and Criteria Work Group List of Cancer Potency Factors	< Oral Slope Factor	Medium
	< Inhalation Slope Factor	

Ecological Effects Data Preference Hierarchy

Data Source	Data Element	Preference Level
SQC Documents	X Sediment Quality Criteria (SQC) Tier I Final Chronic Value (FCV)	Highest
GLWQI Criteria Documents	X Great Lakes Water Quality Initiative (GLWQI) Tier I FCV	Highest
AWQC Documents and <i>Ecotox Thresholds ECO Update</i>	X Ambient Water Quality Criteria (AWQC) FCV	Highest
<i>Ecotox Thresholds ECO Update</i> and HWIR documents	X GLWQI Tier II methodology Secondary Chronic Value (SCV)	High
OPPT	X Measured Chronic Data (EC ₅₀ , EC ₁₀ , LC ₅₀ , or GMATC)	High
OPPT	X Estimated Chronic Data (EC ₁₀ or GMATC)	High
GLWQI Criteria Documents	X GLWQI Tier I Final Acute Value (FAV)	Medium
<i>Draft Quality Criteria for Water</i> (AWQC Documents)	X AWQC Acute CMC	Medium
OERR RQ database and OPPT EPCRA 313 TRI database	X Aquatic Toxicity Reportable Quantity (RQ)	Low
AQUIRE	X Measured Chronic Data (EC ₅₀ , EC ₁₀ , LC ₅₀ , or GMATC)	Low
AQUIRE	X Measured Acute Data (LC ₅₀ or EC ₅₀)	Low
TSCA 8(e)	X Triage screening results	Low
ECOSAR (version 0.99, February 1998)	X Estimated Chronic GMATC	Lowest
	X Estimated Acute Data (LC ₅₀ or EC ₅₀)	

WMPT Fencelines

Persistence: regional persistence values of 140 and 580

Bioaccumulation: BAF/BCF values of 250 and 1,000

Human toxicity: multiple fencelines

Ecological toxicity: multiple fencelines

For Further Information on WMPT Methodology

**Look for *WMPT Spreadsheet Document* on OSW web page:
www.epa.gov/wastemin**

- Includes documentation for revised WMPT and spreadsheets with data/scores for 1,300 highest scoring chemicals

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Current Status of WMPT

May make some additional changes to WMPT over next several months in response to public comments on Draft RCRA PBT List

No OSW funding for further improvements in FY99 – funding in FY00 will depend on interest within OSW or elsewhere

Want to explore opportunities to partner with other organizations to help meet needs for screening information and provide appropriate stewardship of the information

Stewardship

EPA should provide risk-screening information that is current, scientifically sound, transparent, and accessible

Stewardship could potentially include improving underlying data and algorithms, expanding chemical coverage, describing appropriate applications, and obtaining further peer review

Promoting stewardship will enhance EPA's credibility

Stewardship is a challenge, given limited resources

Next Steps for the WMPT?

Are there other potential applications of this type of tool and/or the data it contains?

Are there other tools with similar purpose and function that this tool could be merged with?

Are there opportunities to partner more formally with other organizations inside EPA or outside to provide stewardship?

Speaker Biography: Mark Ralston

Present: Waste Minimization Branch, Office of Solid Waste

Previous: Analyzed cost and benefits of Hazardous Waste Regulations at EPA

Most recently, his work has focused on identifying priorities for source reduction and recycling of hazardous wastes under the Waste Minimization National Plan. As part of this work, he has managed a collaborative effort with EPA's Office of Pollution Prevention and Toxics to develop the Waste Minimization Prioritization Tool, a software program which ranks chemicals based on their persistence, bioaccumulation potential, and human and ecological toxicity. He has also participated in EPA's work to develop the recently-proposed Draft RCRA PBT List and methods to evaluate national progress in waste minimization.